# TARA K. MUENZ
## Assistant Director of Education, Stroud Water Research Center

## EDUCATION

**MASTER OF SCIENCE** **2000-2004**
*University of Georgia, Odum School of Ecology, Athens, Georgia*
Conservation Ecology and Sustainable Development

**BACHELOR OF ARTS** **1994-1998**
*Miami University of Ohio, Oxford, Ohio*
Zoology

## PROFESSIONAL EXPERIENCE

**ASSISTANT DIRECTOR OF EDUCATION** **OCTOBER 2015-PRESENT**
*Stroud Water Research Center* *Avondale, Pennsylvania*

- Program delivery and outreach
  - Teach environmental education programs to a wide variety of audiences.
  - Train citizens on stream monitoring protocols and provide professional development opportunities to teachers, non-formal educators, and other professionals.
  - Contribute to grant funded program deliverables.
  - Publish in peer-reviewed and lay journals, internal newsletters, and social media.
- Program management
  - Lead the management of specific education programs and grants.
  - Design, implement, and analyze program evaluations.
  - Coordinate scheduling, billing, and tracking of education programs.
  - Communicate with participants (clients) in a timely and professional manner.
  - Manage seven part-time and two full-time educators.
  - Contribute to new program development based on Stroud Center science.
  - Collaborate and coordinate with marketing and communications staff to promote education programs.
  - Oversee maintenance and updates to the education web pages and social media.
- Administration
  - Update and maintain education database to keep accurate, complete, and timely work records for internal and external reporting requirements.
  - Assist with new staff recruitment, hiring, training, supervision, and evaluations.
  - Contribute to grant writing and fund-seeking to secure >20% of position funding.
  - Review monthly revenue & expense reports and track 45 different budgets.

*See end of CV for special project involvement.

**EDUCATION PROGRAM MANAGER** **APRIL 2014-OCTOBER 2015**
*Stroud Water Research Center* *Avondale,Pennsylvania*

- Managed the Department's education programming and events
- Coordinated cross-discipline efforts with communication, research, restoration, IT, development, and finance departments
- Set goals and execute strategic plan
- Wrote grants, managed budgets, and prepared reports for National Science Foundation, Environmental Protection Agency, local agencies, and professional society awards
- Instructed over 2,000 students annually in stream ecology concepts (k-12)
- Created new content, improve stream curricula, pilot new programs.
- Trained and supervise education staff
- Translated scientific research to the community via oral, written, or online media
- Fostered partnerships with 40+ organizations and schools
- Served as administrator for the international program Leaf Pack Network
- Developed and presented citizen-based watershed monitoring tools (manuals, database, data forms, instruction and training, implementation plans)
- Project involvement: Trout Grow on Trees®, Rios Saludables de Osa in Costa Rica, Wiki Watershed®, Leaf Pack Network®, Enviro DIY, William Penn Initiatives, Critical Zone Observatory REU/RET Program, Consortium for Scientific Assistance to Watersheds (C-SAW)

**STATE COORDINATOR, GEORGIA ADOPT-A-STREAM** **JANUARY 2009-APRIL 2014**
*Georgia Department of Natural Resources, Environmental Protection Division Non-Point Source Program* *Atlanta, Georgia*

- Implemented, planned, and led statewide volunteer Program
- Developed outreach activities to effectively implement program goals and objectives
- Coordinated and developed network of partners including universities, non profits, private, state, and federal agencies
- Maintained online database for volunteers and assisted with its development including QC measures, data visualization, query functions, overall organization and available tools
- Prepared data on program activities and reports in compliance with program goals
- Prepared semi-annual and annual reports for 319 grants
- Trained, coordinated, and sustained communications with over 3,000 statewide volunteer water quality monitors and 70 AAS local trainers and coordinators
- Maintained community coordinators, AAS trainer and AAS Advisory Board membership
- Coordinated training opportunities and partnerships with 319, TMDL, and regulatory monitoring programs
- Chaired annual volunteer conference with over 240 attendees for 5 years
- Managed fiscal partnership budgets and grants
- Designed and published 24 bimonthly newsletters
- Led research and education team for five years on Paddle Georgia Event; a 100-mile river trip with over 400 participants.
- Co-led development of new online database; revised all of Program's manuals, data forms, presentations; initiated method comparison study (volunteer vs. federal methods).

**LEAD RESEARCH TECHNICIAN, AQUATIC BIOLOGY LABORATORY** **JUNE 2004-JANUARY 2009**
*Joseph W. Jones Ecological Research Center* *Newton, Georgia*

- Scheduled and supervised field studies onsite and offsite in the Lower Flint River Basin
- Managed and developed databases including sample outputs and laboratory budget

- Coordinated sampling schedules and resources with graduate students, research technician, and other laboratories
- Supervised and trained research technicians
- Organized and maintained laboratory
- Assisted in writing grants
- Instructed visiting university classes in wetland, stream, and invertebrate ecology
- Conducted teacher training workshops
- Prepared manuscripts; served as reviewer for selected journals
- Project Involvement: Seston sampling and processing; freshwater mussel surveys and tagging; wetland sampling; aquatic macroinvertebrate sampling and ID; GIS landscape analysis; watershed-wide sampling.

**GRADUATE RESEARCH ASSISTANT** **2000-2004**
*University of Georgia/ Jones Ecological Research Center* *Athens, Georgia*
*Dr. Stephen W. Golladay major advisor*

Thesis Title: Streamside buffer effectiveness: macroinvertebrate and amphibian species as indicators of stream health in an impacted agricultural system, southwest Georgia.

- Conducted macroinvertebrate, amphibian, vegetation, physical habitat, and water quality surveys.
- Supervised and trained research assistants.
- Maintained database and analyzed of data.
- Identified aquatic macroinvertebrates and amphibians to species-level.
- Collaborated with state agencies and landowners in developing conservation management options for study area.
- Educated landowners on the past and present ecology of their streams.
- Maintained operating budget for project.
- Produced outreach materials including publications and final reports.

## WORKSHOPS, COURSES, AND OTHER OUTREACH ACTIVITIES

***INSTRUCTOR:***

- Leaf Pack Network International Program (1-2 day trainings for teachers, Trout Unlimited, watershed groups)
- New Jersey Department of Environmental Protection's Stream School & Ambassador Trainings for citizen monitors in watershed assessments (physical, macroinvertebrate, chemical, bacterial).
- EnviroDIY Stream Sensor Workshops (teachers and citizen scientists)
- Pennsylvania State Parks; advanced macroinvertebrate identification and chemistry training.
- Pennsylvania Master Watershed Steward Program Trainings
- Georgia Adopt-A-Stream (AAS) Training workshops in Chemical, Bacterial, Macroinvertebrate, Amphibian and Physical Habitat Monitoring, data management & visualization; 2004-2014; Led over 350 workshops
- Georgia Master Naturalist Trainings: Aquatic ecology (water chemistry, macroinvertebrates, amphibians)
- Georgia State Parks, Naturalist Training in aquatic macroinvertebrates and amphibians
- Project WET, WILD, PLT Triple Facilitator Course, amphibian training
- Environmental Education Research Academy (EERA), teacher training workshop, 2004-2008
- Watershed Awareness, Tifton, Georgia, 2002
- Introduction to Stream Restoration Using Natural Channel Design Techniques, 2003

- Freshwater Mussel Ecology and Identification, 2005-2008

***ASSISTANCE WITH UNIVERSITY, SOCIETY AND NONPROFIT COURSES:***

- Course Topics: bioassessment, Stream monitoring protocols, stream ecology, longleaf pine ecosystem ecology, mussel ecology, the art and ecology of barrier islands
- Stream Ecology classes for the University of Pennsylvania, Temple University, West Chester University, Lincoln University, University of Georgia, Millersville University.
- Coordinator for Stroud Water Research Center's CZO National Science Foundation REU/RET program, 2014-2016. In partnership with The Pennsylvania State University.
- Isolated Wetland Ecology and Invertebrate Identification, 2004-2008 maymester course with UGA.

## PROFESSIONAL OUTREACH

### PUBLICATIONS

- W. Tietjen, S. Becker, **T.K. Muenz**, S.W. Golladay. 2016. *Accepted.* Spider Fauna of three geographically isolated wetland types in Southwestern Georgia. Southeastern Naturalist.
- Dyson, D.S., **T.K. Muenz**, E.Reutebuch.2014. Alabama Water Watch and Georgia Adopt-A-Stream Partner with the U.S. Forest Service to Monitor and Protect Watersheds in the Escambia Experimental Forest. Alabama's Treasured Forest Magazine, Alabama Forestry Commission.
- **Muenz, T.K.,** S.W. Golladay, L.L. Smith, and G.Vellidis. 2008. Diet and Abundance of the Southern Two-lined Salamander (*Eurycea cirrigera)* in an agricultural area, southwest Georgia. Southeastern Naturalist. 7(4): 691-704.
- **Muenz, T.K.,** A.Kaeser, B.Bass, and D.Steen. 2008. Predation of the spiny softshell (*Apalone spinifera*). Herpetological Review 39:2.
- **Muenz, T.K.,** S.P.Opsahl, S.W. Golladay, D.W. Hicks, B.Clayton, and R.C. Thomas. 2007. Viability of mussel habitat condition and conservation priority areas in the Flint River Basin. in T. Rasmussen (ed), Proceedings of the 2007 Georgia Water Resources Conference. Athens, Georgia.
- S.W. Golladay, D.W. Hicks, and **T.K. Muenz.** 2007. Long-term changes in stream flow in the lower Flint River Basin, Southwestern Georgia, associated with water use and climatic variation. in T. Rasmussen (ed), Proceedings of the 2007 Georgia Water Resources Conference. Athens, GA.
- **Muenz, T.K.** S. W. Golladay, G. Vellidis, and L. L. Smith. 2006. Journal of Environmental Quality. Stream Buffer Effectiveness in an Agriculturally Influenced Area, Southwestern Georgia: Responses of Water Quality, Macroinvertebrates, and Amphibians. 35:1924-1938.
- **Muenz, T.K**., S.P. Opsahl, S. W. Golladay D. W. Hicks, B.Clayton, K. A. Cressman. 2006. Final Report to the U.S. Fish and Wildlife Service. Assessment of stream habitat in the Flint River Basin.
- **Muenz, T.K.** 2006. CSA magazine article. Stream health indicators and conservation buffers: amphibians and aquatic invertebrates show potential.
- S.W. Golladay and **T. K Muenz.** Survey and relocation study of unionids in Chickasawhatchee Creek and Elmodel Wildlife Management Areas, Southwest Georgia: Final Report. Georgia Department of Natural Resources, October 2006.
- **Muenz, T.K.** S. W. Golladay, L. L. Smith, and G. Vellidis. 2005. Using Adopt-A-Stream in the Coastal Plain: A case study in southwest Georgia. Pp. 819-822, in K. Hatcher (ed), Proceedings of the 2005 Georgia Water Resources Conference. Athens, Georgia.
- Chastain, C.A., S.W. Golladay, and **T.K.Muenz**. 2005. Historic and current unionid mussel distribution in tributaries of the lower Flint River, Southwest Georgia. Proceedings of the Georgia Water Resources Conference. Athens, GA.
- **Muenz TK** and LL Smith. 2005. County records for: *Pseudotrition ruber* (Red Salamander). Herpetological Review 36:73
- **Muenz TK** and LL Smith. 2005. County records for: *Hyla chrysoscelis* (Cope's Gray Tree

Frog). Herpetological Review 36:74.

- **Muenz TK** and LL Smith. 2005. County records for: *Hyla squirella* (Squirrel Tree frog). Herpetological Review 36:75.
- **Muenz TK** and LL Smith. 2005. County records for: *Storeria occipitomaculata* (Red-bellied Snake). Herpetological Review 36:84.
- **Muenz, T.K**., S.W. Golladay, G. Vellidis, and L.L. Smith. 2003. Streamside buffer effectiveness: Macroinvertebrate and amphibian species as indicators of water quality in an impacted agricultural system, Coastal Plain, Georgia. Pp.354-357, vol.1, in K. Hatcher (ed), Proceedings of the 2003 Georgia Water Resources Conference. Athens, GA.
- **Muenz, T.K**. and K.M. Andrews. 2002. The recovery of nesting habitat: a proactive approach for conservation of the hawksbill sea turtle, *Eretmochelys imbricata*, Long Island, Antigua, West Indies. Proceedings of the Twenty-third Symposium on Sea Turtle Biology. Miami, FL.

SELECTED PRESENTATIONS

- Kerlin, S. and **Muenz, T.K.** (oral). 2016. Open Source Online GIS to Teach Watershed Modeling. North American Association for Environmental Education Conference, Madison, WI.
- **Muenz, T.K.,** (Oral). 2016. Slimy Leaves for Healthy Streams, Training in the Leaf Pack Network. National Science Teacher Assoc. Conference, Nashville, TN.
- Marcum-Dietrich, C., Staudt, C., & **Muenz**, **T.K.** (oral). NSF Teaching Environmental Sustainability-Model My Watershed. National Science Teacher Assoc. Conference, Nashville, TN.
- **Muenz, T.K**, (Poster). 2015. Model My Watershed. American Association for the Advancement of Science, San Jose, CA.
- Aufdenkampe, A., Daniels, M., & **Muenz, T.K**. (March 12, 2016). (Oral). Model My Watershed v2: An online Professional Toolkit for Restoration in the Delaware River Basin. Schuylkill Watershed Congress, PA.
- **Muenz, T.K.,** (March 13-15, 2016). (Workshop). Trout Grow on Trees. Pennsylvania Association for Environmental Educators State Conference, Poconos, PA.
- Sweeney, B.S, **Muenz T.K.** Water Quality Monitoring with Leaf Packs. 2014. River Rally, River Network Annual Conference. Pittsburgh, PA.
- **Muenz, T.K**. Amphibian Monitoring with Georgia Adopt-A-Stream. 2012. National Water Quality Monitoring Conference, Portland, Oregon.
- **Muenz, T.K.** Evaluating Volunteer Monitoring Program Success (3-hour Workshop). 2012. National Water Quality Monitoring Conference, Portland, Oregon.
- **Muenz, T.K.** 2011. Landscaping for sea turtles. 2011 WIDECAST Annual Meeting at the 31st International Sea Turtle Symposium. San Diego, CA.
- **Muenz, T.**K. and J. Buitrago. 2011. Landscaping for Sea Turtles: Nesting Habitat Designs for

  the Hawksbill Sea Turtles, Eretmochelys imbricate on a Developed Beach, Long Island, Antigua, West Indies. 31st International Sea Turtle Symposium. San Diego, CA.
- **Muenz, T.K.,** S.W. Golladay, D.W. Hicks, and R.C. Thomas. 2008. Land use and streamflow change in the Lower Flint River Basin Georgia. Environmental Flows Conference. Athens, GA.
- **Muenz, T.K.,** S.W. Golladay, D.W. Hicks, and R.C. Thomas. 2008. Streamflow challenges to freshwater mollusks in the Lower Flint River Basin Georgia: Implications for conservation priority areas. Society for Conservation Biology Meeting. Chattanooga, TN.
- **Muenz, T.K.,** S.P. Opsahl, K.A. Cressman, and S.W. Golladay. March 2007. A Regional Assessment of Historical Mussel Habitat Condition in the Flint River Basin, Georgia. Freshwater Mollusk Conservation Society Meeting, Little Rock, AR.
- S.W. Golladay, D.W. Hicks, and **T.K. Muenz.** 2006. Long-term changes in stream flow in the lower Flint River Basin, Southwestern Georgia, associated with water use and climatic variation. North American Benthological Society Meeting, Anchorage, AK.
- S.W. Golladay, D.W. Hicks, and **T.K. Muenz.** 2006. Long-term changes in stream flow in the lower Flint River Basin, Southwestern Georgia, associated with water use and climatic variation.

The Lower ACF Conference, Albany, GA.

- **Muenz, T.K.,** S.P. Opsahl, K.A. Cressman, and S.W. Golladay. 2006. A Regional Assessment of Historical Mussel Habitat Condition in the Flint River Basin, Georgia. North American Benthological Society Meeting, Anchorage, AK.
- **Muenz, T.K.,** S.P. Opsahl, K.A. Cressman, and S.W. Golladay. 2006. A Regional Assessment of Historical Mussel Habitat Condition in the Flint River Basin, Georgia. The Lower ACF Conference, Albany, GA.
- M.J.Kaeser, L.K.Kirkman, L.L.Smith, S.W. Golladay, A.E. Liner, **T.K.Muenz,** D.A.Steen. 2006. Biodiversity in depressional wetlands: A pilot study in cross-taxon congruence of species diversity in southwest Georgia. Ecological Society of America, Memphis, TN.
- **Muenz, T.K.** 2005. Adopt-A-Stream and Professional Data: How do They Compare? A look at the Invertebrate Index. Georgia Rivers Network Conference, Milledgeville, GA. Invited speaker.
- **Muenz, T.K**. S. W. Golladay, L. L. Smith, and G. Vellidis. 2005. Using Adopt-A-Stream in the Coastal Plain: A case study in southwest Georgia. Georgia Water Resources Conference. Athens, GA
- **Muenz, T.K**. and K.M. Andrews. 2005. The reconciliation of hawksbill (*Eretmochelys imbricata)* nesting habitat with vegetation islands on Long Island, Antigua, West Indies. Twenty-fifth Annual Symposium on Sea Turtle Biology. Savannah, Georgia.
- Cressman, K.A., S.P.Opsahl, **T.K. Muenz**, and S.W. Golladay. 2005. A comparison of streamside habitat assessments and water quality indicators in the lower Flint River Basin. Do they agree? North American Benthological Society Conference, New Orleans, LA.
- **Muenz, T.K**., S.W. Golladay, G.Vellidis and L.L. Smith. 2003. Streamside buffer effectiveness: Macroinvertebrate and amphibian species as indicators of water quality in an impacted agricultural system, Coastal Plain, Georgia. Georgia Water Resources Conference. Athens, GA.
- **Muenz, T.K**., L.L. Smith, S.W. Golladay, and G.Vellidis. 2003. Amphibians as indicator species for stream recovery: A case study from the Coastal Plain, Georgia. All Florida Herpetology Conference, Gainesville, FL.
- Andrews, K.M. and **T.K. Muenz**.2002. The recovery of nesting habitat with vegetation islands: Conservation challenges for the hawksbill sea turtle, *Eretmochelys imbricata* on Long Island, Antigua, West Indies. Ecological Society of America/ Society for Ecological Restoration Conference, Tucson, AZ.
- **Muenz, T.K**. and K.M. Andrews.2002. The recovery of nesting habitat: A proactive approach for conservation of the hawksbill sea turtle, *Eretmochelys imbricata*, Long Island, Antigua, West Indies. Twenty-third Annual Symposium on Sea Turtle Biology. Miami, FL.
- **Muenz, T.K**., S.W. Golladay, and G.Vellidis. 2002. Stream buffer effectiveness: Macroinvertebrate and salamander species as bioindicators of ecosystem stress, Coastal Plain, Georgia. Ecological Society of America/ Society for Ecological Restoration Conference, Tucson, AZ.

## CERTIFICATIONS

- GEORGIA ADOPT-A-STREAM TRAINER (MACROINVERTEBRATE, BACTERIA, CHEMISTRY) 2009-PRESENT
- PROJECT WET FACILITATOR, 2014
- Project Learning Tree, Project Wild, Project Aquatic Wild, Project WET
- PADI Scuba certification, 2007
- First Aid, CPR, 2016
- Federal and State of Pennsylvania Background checks current
- Attended Trainings: Stream Stabilization Techniques Workshop, AUBURN UNIVERSITY, 2012; Prescribed Fire Course., J.W. Jones Ecological Research Center; Freshwater Mussel Identification. Co-sponsored by Columbus State University, J.W. Jones Ecological Research Center.

## AWARDS & GRANTS

- National Science Foundation Sub-award for "Learning to see, seeing to learn." ($104,000 for 3 yrs); 2015. Lead PI for sub-award.
- Environmental Protection Agency National Environmental Education Grant for "Greening STEM technologies: A model for advancing do-it-yourself (DIY) environmental sensing networks to support citizen science and primary and secondary education." ($191,200 for 2 years); 2015. Co-PI and manager of budget; manage ten sub-grantees.
- Small grants from local funders ($500 to $4,000)
- 2015 Environmental Outreach Program of the Year, Stroud Water Research Center Education Department
- Conservationist of the Year, Georgia River Network, 2012
- UGA Research Assistantship, 2001-2003
- Undergraduate Summer Scholars (USS) research scholarship, 1997
- STARS undergraduate research scholarship, 1996 and 1997

## SERVICE

- White Clay Creek Education Committee, 2014-present
- Soul, Mind, Body Science Committee, 2016-prseent
- Board Member and Membership Committee Chair; Pennsylvania Association of Environmental Educators (PAEE), 2014- present
- Board Member, Georgia Adopt-a-Stream, 2004- present
- Board Member, Environmental Education Alliance of Georgia; Chair for Member Services Committee, 2010-2014
- Board Member, Chattahoochee Hill Country Conservancy Board of Directors, serving as the watershed stewardship chair, 2010-2014
- Natural Resources Committee Member, Chattahoochee Hill Country Comprehensive Plan
- Committee Member of the John's Creek Community Habitat Certification Initiative through the National Wildlife Federation, 2010-2011.
- Lead Organizer of Volunteer River Cleanups (Rivers Alive), 2005-2013
- Freshwater Mollusk Conservation Society: served on education and outreach as well as public policy committees
- Partners in Amphibian and Reptile Conservation: served on education/outreach group

## AFFILIATIONS & MEMBERSHIPS

North American Association for Environmental Education (NAAEE), 2016-present
Pennsylvania Association of Environmental Educators (PAEE), 2014-present
National science teacher association
Ecological Society of America
Society for Freshwater Science
Society for Conservation Biology
International Sea Turtle Society
Society for Freshwater Molluscs
Society for Ecological Restoration
Georgia River Network
River Network

## WATCH AND LISTEN TO TARA LIVE!

NPR/WHYY Philadelphia, interview on the Leaf Pack Network, 2014:
http://www.newsworks.org/index.php/nwtonight/item/76445-citizen-scientist-track-tiny-critters-to-determine-health-of-the-watershed
PROGRAM VIDEO: As state coordinator for Georgia Adopt-A-Stream, 2014:
https://www.youtube.com/watch?v=f9C67d5OsmI&feature=share
NBC 41, Macon, GA: As state coordinator for Georgia Adopt-A-Stream 2013:
https://www.youtube.com/watch?v=bJGY0BBSseM&feature=youtu.be
INSTRUCTIONAL VIDEO for Georgia Adopt-A-Stream (co-directed): https://www.youtube.com/watch?v=7POkh86j4oE
DELAWARE BIOBLITZ (at 1:54 mins): https://www.youtube.com/watch?v=PFAIkkIRiig

## SPECIAL PROJECTS

**Developing a Water Atlas for the ACOSA Region of Costa Rica**
***Funded by: Blue Moon Fund***
Stroud Center biologists are working with researchers and managers in the ACOSA region of southwestern Costa Rica to collect and disseminate information on streams and rivers to a variety of community stakeholders. The two-year project, which started in 2013, includes (1) education programs to teach school students, researchers, and other citizens about stream health and monitoring protocols; (2) professional surveys conducted by Stroud Center biologists; (3) and development of an online water atlas to store, visualize, and share data among government managers and scientists, nongovernmental organizations, and citizens. Principal Investigator: William H. Eldridge
Collaborators: Bernard W. Sweeney, David B. Arscott, and **Tara Muenz**

**Learning to See, Seeing to Learning**
***Funded by: National Science Foundation***
Stroud Center educators in collaboration with Carnegie Mellon University created and implemented a national survey of macroinvertebrate trainers and training programs. Education and entomology staff helped decide which 150 macroinvertebrates will be shown as gigapan images on Macroinvertebrates.org. Education staff continue to contribute to the development of the site.
Project Leads: Marti Louw (Carnegie Mellon University); **Tara Muenz**
Collaborators: Steven C. Kerlin, John K. Jackson, Matthew J. Wilson, Michael C. Broomall, and Kelly C. McIntyre; John Morse (Clemson University); Lauren Allen (Carnegie Mellon University); John Wenzel (Carnegie Museum of Natural History)

**Greening STEM Technologies: A Model for Advancing Do-It-Yourself (DIY) Environmental Sensing Networks to Support Citizen Science and Primary and Secondary Education**
***Funded by: U.S. Environmental Protection Agency***
Stroud Center education and technical staff created STEM technologies to enhance public capabilities in citizen science. Partnerships with schools will lead to curricula and tools in 2017 and the installation of stream-monitoring stations. Project Leads: David B. Arscott and **Tara Muenz** Collaborators: Shannon Hicks, Steven C. Kerlin, and Heather Brooks

**Comprehensive Aquatic Learning Project**
***Funded by: 3M*** This collaborative partnership with Tyler Arboretum initiates teacher training programs in watershed research and education. We engaged teachers in our Leaf Pack Network, conducting a one-day intensive training in methods, macroinvertebrate identification and freshwater ecology. Project Leader: **Tara Muenz**

**Consortium for Scientific Assistance to Watersheds (C-SAW) Funded by: Consortium for Scientific Assistance to Watersheds**
Stroud Center educators and scientists provided technical assistance to county conservation districts, municipal environmental advisory committees, watershed associations and citizen action groups as part of a partnership of nine organizations across Pennsylvania whose goal is to teach conservation groups how to conduct effective watershed assessments and restoration efforts.
Project Leaders: Dave Arscott and **Tara Muenz**

**Stream School for New Jersey Department of Environmental Protection (NJ DEP)**
***Funded by: NJ DEP***
Stroud Center continues to provide expertise in two sets of two-day stream ecology trainings for AmeriCorps New Jersey Watershed Ambassadors and citizen water quality monitoring volunteers. NJ DEP utilizes volunteer data, at the state level, for assessing the health of its water bodies.
Project Leader: **Tara Muenz**

**Stroud Stream Programs for Public Schools**
***Funded by: The Education Improvement Tax Credit Program (EITC)***
Stroud Center educators conduct a four-hour boots-in-the-water stream program for students in fourth through 12th grade. It is funded by approved business within the EITC program. Students visit Stroud Center, where we engage them in the many decades of research we do here. We cover aquatic insect collection and identification as well as instruction on the importance of trees for stream health. The program helps students better understand their impact on our waterways and how they can protect and improve this vital resource for all life.
Project Leader: **Tara Muenz**

**Trout Grow on Trees**
**Funded by: DuPont Clear Into the Future**
This project produces written curriculum materials and pilot tests a beta version of the new environmental education program Trout Grow On Trees in elementary schools in the Christina River watershed. It also shares the curriculum materials with teachers, school administrators and the general public through academic, news and social media outlets. Principal Investigators: Bernard W. Sweeney and **Tara Muenz**

**2015 Brandywine Trek at Point Lookout**
***Funded by: Point Lookout Foundation***
The Brandywine Trek is a youth leadership and environmental awareness program that combines outdoor learning and physical activities over five days of hiking, canoeing, and camping along the Brandywine River. Trek activities are designed to build leadership skills, promote cultural and historical competence, and develop an understanding of watershed management and water resource linkages among our communities.
Project Lead: David B. Arscott Collaborators: **Tara Muenz;** Jarvis Berry (Coatesville Youth Initiative); Sky Prestowitz (UrbanPromise, Wilmington)

**Collaborative Research: Introducing Critical Zone Observatory (CZO) Science to Students and Teachers**
***Funded by: National Science Foundation***
The Critical Zone encompasses the external or near-surface Earth extending from the top of the vegetation canopy down to and including the zone of freely circulating groundwater. This project engages college students and teachers in a summer research internship studying two observatories: the Christina River Basin and the Susquehanna Shale Hills site. Participants

engage in real-world, hands-on experiences examining and presenting on their particular research focus within the Critical Zone.
Principal Investigators: Anthony K. Aufdenkampe and Susan Gill; Timothy S. White (The Pennsylvania State University)
Collaborators: **Tara Muenz,** David B. Arscott, Jinjun Kan, Melinda D. Daniels, and Heather Brooks; Holly Michael and Jim Pizzuto (University of Delaware)

**SFS Leaf Pack Workshop**
*Funded by: Society for Freshwater Science*
Stroud Center staff and members of the SFS Education and Diversity Committee hold annual Leaf Pack workshops prior to the society's annual meeting. The workshop introduces educators and citizens to the Leaf Pack Experiment and its utility as a stream assessment and teaching tool for middle school and high school students and interested members of the public.
Project Lead: Tara Muenz Collaborator: Bernard W. Sweeney

**Stroud Water Research Center Streamside Classroom Project**
***Funded by:*** E. Kneale Dockstader Foundation
This project enhances our streamside classroom along White Clay Creek at Stroud Water Research Center with the construction of three educational kiosks and various interpretive signs and seating areas. Interpretive signage promotes a more innovative, intimate, and open learning environment while also effectively addressing the important connection between streamside forests and the ecology of rivers and streams. Components of this infrastructure were built by a student seeking Eagle Scout rank with the Boy Scouts of America. Project Lead: David B. Arscott
Collaborators: **Tara Muenz,** Rebecca Duczkowski, and William Milliken; Yeda L. Arscott (Arscott Architectural and Graphic Design)